# 6BA7

# PENTAGRID CONVERTER

9-PIN MINIATURE TYPE

## GENERAL DATA

**Electrical:**

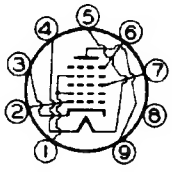
| | | |
|---|---|---|
| Heater, for Unipotential Cathode: | | |
| Voltage | 6.3 | ac or dc volts |
| Current | 0.3 | amp |
| Direct Interelectrode Capacitances:o | | |
| Grid No.3 to All Other Electrodes (RF Input) | 9.5 | μμf |
| Plate to All Other Electrodes (Mixer Output) | 8.3 | μμf |
| Grid No.1 to All Other Electrodes (Osc. Input) | 6.7 | μμf |
| Grid No.3 to Plate | 0.19 max. | μμf |
| Grid No.3 to Grid No.1 | 0.1 max. | μμf |
| Grid No.1 to Plate | 0.05 max. | μμf |
| Grid No.1 to All Other Electrodes Except Cathode | 3.4 | μμf |
| Grid No.1 to Cathode | 3.3 | μμf |
| Cathode to All Other Electrodes Except Grid No.1 | 4.0 | μμf |

o With no external shield.

**Mechanical:**

| | |
|---|---|
| Mounting Position | Any |
| Maximum Overall Length | 2-5/8" |
| Maximum Seated Length | 2-3/8" |
| Length, Base Seat to Bulb Top (excluding tip) | 2" ± 3/32" |
| Maximum Diameter | 7/8" |
| Bulb | T-6-1/2 |
| Base | Small-Button Noval 9-Pin |
| Basing Designation for BOTTOM VIEW | 8CT |

Pin 1 - Grids No.2 & No.4
Pin 2 - Grid No.1
Pin 3 - Cathode
Pin 4 - Heater
Pin 5 - Heater




Pin 6 - Grid No.5, Internal Shield
Pin 7 - Grid No.3
Pin 8 - Internal Shield
Pin 9 - Plate

## CONVERTER SERVICE

**Maximum Ratings,** ***Design-Center Values:***

| | | |
|---|---|---|
| PLATE VOLTAGE | 300 max. | volts |
| GRID-No.5 & INTERNAL-SHIELD VOLTAGE ▲ | 0 max. | volts |
| GRIDS-No.2 & No.4 VOLTAGE | 100 max. | volts |
| GRIDS-No.2 & No.4 SUPPLY VOLTAGE | 300 max. | volts |
| PLATE DISSIPATION | 2.0 max. | watts |
| GRIDS-No.2 & No.4 DISSIPATION | 1.5 max. | watts |
| TOTAL CATHODE CURRENT | 22 max. | ma |

▲ See next page.

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| | | | |
|---|---|---|---|
| GRID-No.3 VOLTAGE: | | | |
| Negative bias value. . . . . | 100 max. | | volts |
| Positive bias value. . . . . | 0 max. | | volts |
| PEAK HEATER-CATHODE VOLTAGE: | | | |
| Heater negative with respect to cathode. | 90 max. | | volts |
| Heater positive with respect to cathode. | 90 max. | | volts |

**Characteristics - *Separate Excitation:****

| | | | |
|---|---|---|---|
| Plate Voltage. . . . . | 100 | 250 | volts |
| Grid-No.5 & Internal Shield. . | Connected directly to ground | | |
| Grids-No.2 & No.4 (Screen) Voltage . . . | 100 | 100 | volts |
| Grid-No.3 (Control Grid) Voltage . . . . | -1 | -1 | volt |
| Grid-No.1 (Oscillator Grid) Resistor . . | 20000 | 20000 | ohms |
| Plate Resistance (Approx.) . . . . . | 0.5 | 1 | megohm |
| Conversion Transconductance . . . . . | 900 | 950 | μmhos |
| Conversion Transconductance (Approx.)# . | 3.5 | 3.5 | μmhos |
| Plate Current. . . . . | 3.6 | 3.8 | ma |
| Grids-No.2 & No.4 Current. . . . . | 10.2 | 10 | ma |
| Grid-No.1 Current. . . . . | 0.35 | 0.35 | ma |
| Total Cathode Current. . . . . | 14.2 | 14.2 | ma |

NOTE: The transconductance between grid No.1 and grids No.2 & No.4 connected to plate (not oscillating) is approximately 8000 micromhos under the following conditions: signal applied to grid No.1 at zero bias; grids-No.2 and No.4 and plate at 100 volts; grid No.3 grounded. Under the same conditions, the plate current is 32 milliamperes and the amplification factor is 16.5.

▲ Internal shield (Pins No.6 and No.8) connected directly to ground.

* The characteristics shown with separate excitation correspond very closely with those obtained in a self-excited oscillator circuit operating with zero bias.

\# With grid-No.3 bias of -20 volts.

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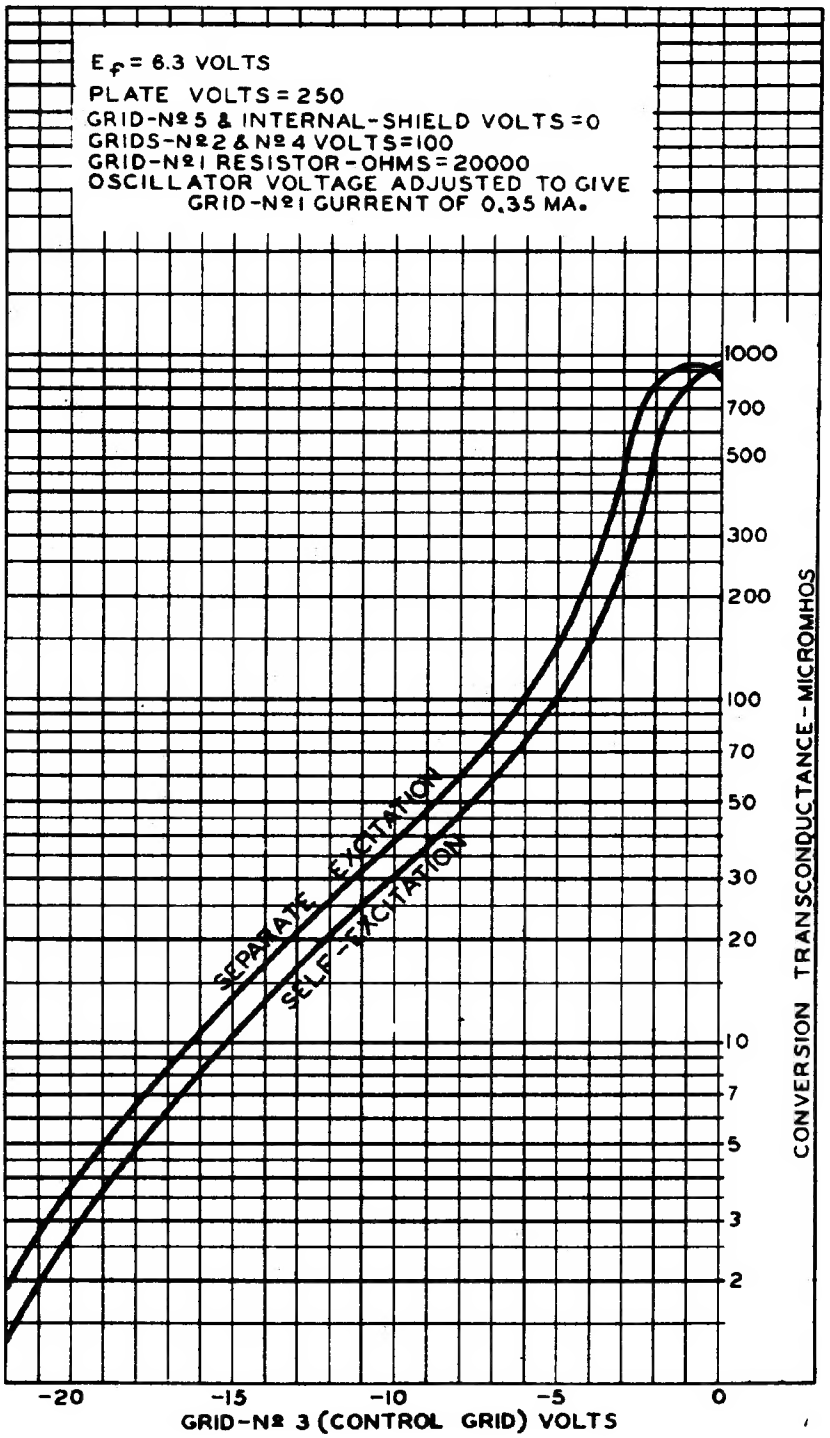
## OPERATION CHARACTERISTICS



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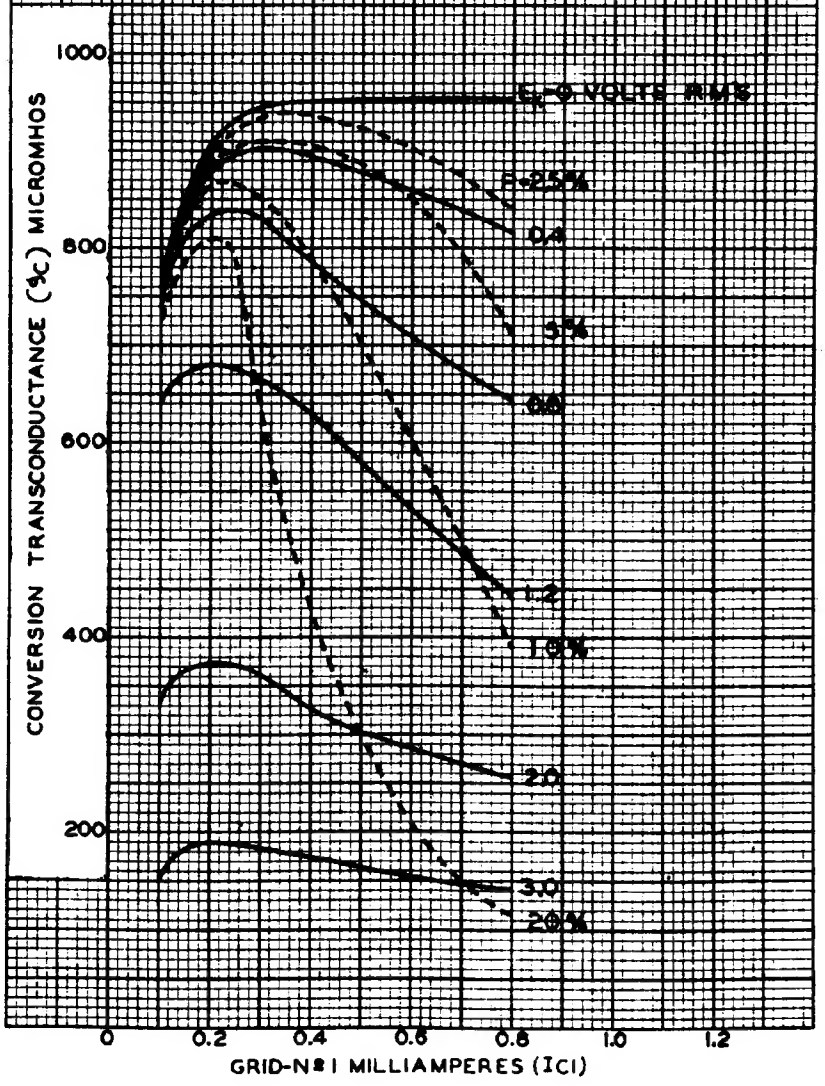
## OPERATION CHARACTERISTICS
### WITH SELF-EXCITATION

$E_f$ = 6.3 VOLTS
PLATE VOLTS = 250
GRID-№5 & INTERNAL-SHIELD VOLTS=0
GRIDS-№2 & №4 VOLTS = 100
GRID-№3 (CONTROL GRID) VOLTS = -1
GRID-№1 RESISTOR-OHMS = 20000
P-PERCENTAGE RATIO OF $E_K$ TO $E_K + E_g$, WHERE
$E_K$ = VOLTAGE ACROSS OSCILLATOR-COIL SECTION BETWEEN GROUND AND CATHODE AND
$E_g$ = OSCILLATOR VOLTAGE BETWEEN CATHODE AND GRID




AUGUST 25,1948 TUBE DEPARTMENT 92CM-6981RI
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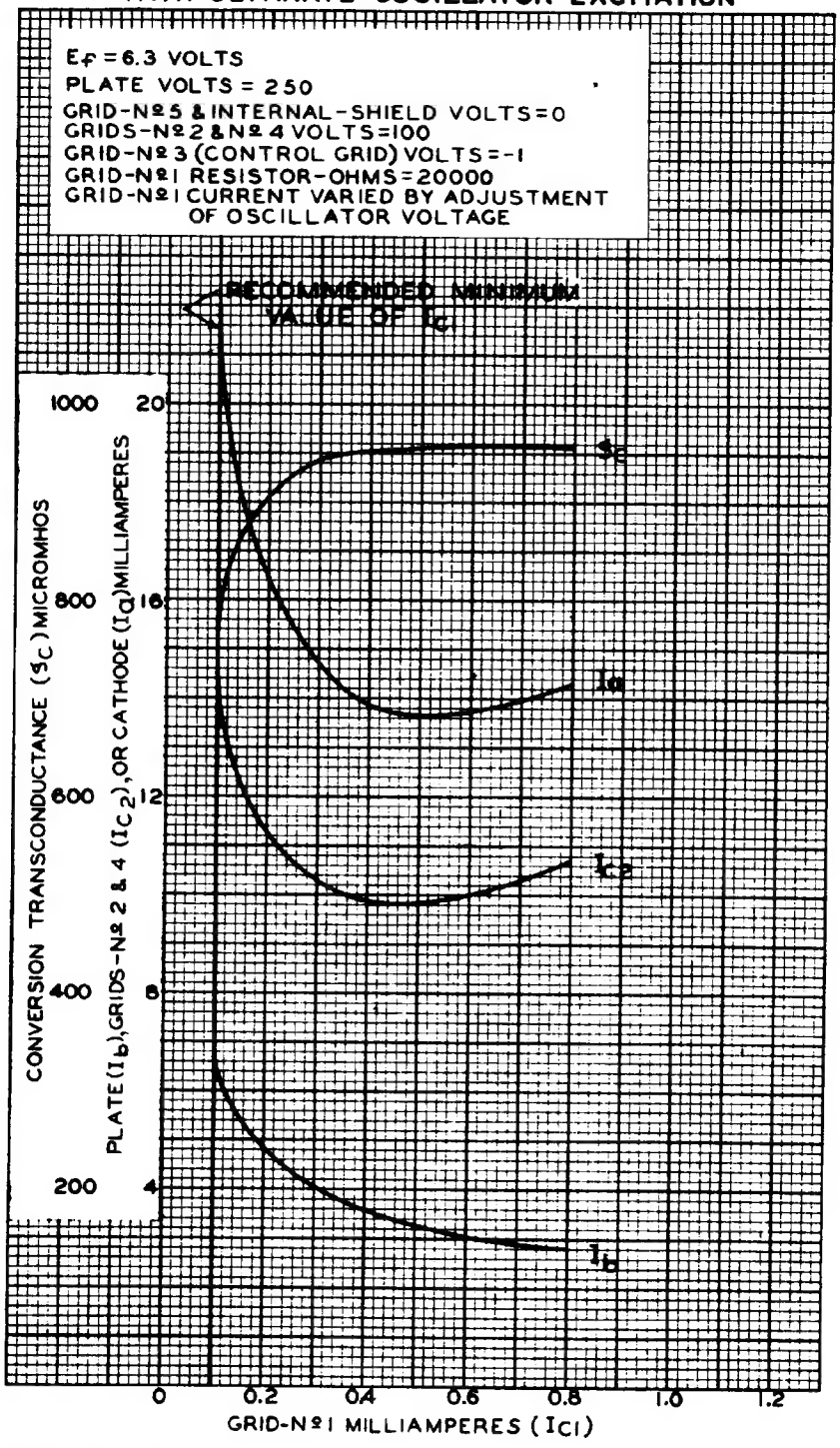
## OPERATION CHARACTERISTICS
## WITH SEPARATE OSCILLATOR EXCITATION

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